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# VACUUM CLEANER TOOL FOR SUCTION OF HARD AND/OR SOFT SURFACES

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## Cross-Reference to Related Applications

This application is entitled to the benefit of and incorporates by reference  
essential subject matter disclosed in International Application No.

10 PCT/SE00/01378 filed on June 29, 2000 and Swedish Patent Application No.  
9902447-3 filed on June 29, 1999.

## Field of the Invention

15 The present invention relates to a vacuum cleaner nozzle for the vacuum  
cleaning of hard and/or soft surfaces, whereof one end is designed to be  
connected to the vacuum cleaner hose handle and the other end is equipped with  
an inner tube surrounded by a clear space permitting the wand for the floor  
nozzle to be fitted upon said inner tube.

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## Background of the Invention

[Swedish Patent 509 890 discloses a] A nozzle which can be left in place on the  
vacuum cleaner hose handle even when the wands of the floor nozzle are  
connected to the vacuum cleaner is known. Switching between the use of a dust  
25 brush nozzle and of a floor nozzle is facilitated thereby. A drawback of the  
above-mentioned solution is that the dust brush nozzle, or the mounting thereof  
on the hose handle, is dependent on the length of the hose handle in order for  
the mouth of the hose handle to be correctly positioned in relation to the  
bevelled mouth opening of the nozzle body. This is a problem because the  
30 length of the hose handle can vary between makes.

## Summary of the Invention

The purpose of the present invention is to eliminate the above-mentioned  
drawback by integrating a tube into the dust brush nozzle so that the hose  
35 handle can be inserted into one end of the dust brush nozzle and the wands can  
be fitted to its other end. This provides a general-purpose dust brush nozzle or

flat nozzle with a convenient contact angle (claim 6), which does not need to be moved from its active position when the floor nozzle and wands are in use (claim 1). The user can easily switch between floor cleaning and the use of the dust brush/flat nozzle without the need to put down the floor nozzle and wands in order to free one hand. The invention also permits the dust brush and the flat nozzle to be combined as a combination nozzle with retained ease of use (claim 5).

#### Brief Description of the Drawings

10 The invention is explained more particularly below with the aid of Figures 1 to 6. Figures 1 and 2 show a flat nozzle, figures 3 and 4 a dust brush nozzle, and Figures 5 and 6 a combination nozzle.

#### Detailed Description of the Preferred Embodiments

15 Figures 1 and 2 show in perspective and in section, respectively, a nozzle body (3) provided at one end with a hole of a suitable fit for connection to the hose handle (2). The interior of the nozzle consists of a tube (5) onto which the wand of the floor nozzle is fitted when desired. The nozzle body (3) exhibits at its far end (4) from the vacuum cleaner a mouth opening cut at a bevelled angle in relation to  
20 the central axis. The bevelled mouth opening forms angle of approximately 45 degrees with said central axis. The length of the inner tube is chosen so that the mouth of the tube comes to be situated approximately at that edge of the bevelled mouth opening which is nearer to the vacuum cleaner. Wands are readily fitted onto the inner tube by pressing the end of the wand against the far  
25 end of the inner surface of the nozzle body and inserting it into the nozzle body. If the inner tube of the nozzle body and its outer shell are correctly sized, the wand (6) will slide in accurately onto the inner tube (5). The bevel angle of approximately 45 degrees of the nozzle body (3) is chosen so that the surface of the bevelled mouth opening will be approximately horizontal when the hose  
30 handle (2) is held in the hand in the same way as when vacuuming the floor with the floor nozzle.

The edge of the bevelled mouth opening (4) is designed so that it can be used as an effective and gentle flat nozzle for e.g. the vacuuming of textiles. The edge may be provided with e.g. tooth-like notches so that air will be sucked in through the notches, entraining dust from the surface being cleaned. The edge may also  
5 be lined with a Velcro-like adhesive material.

Figures 3 and 4 show in perspective and in section, respectively, a brush head (1) mounted on the bevelled end (4) of a nozzle body (3) so that the end of the brush head itself forms an angle of approximately 45 degrees with the axis of the nozzle  
10 body. Thus a dust brush nozzle is formed having a convenient contact angle and with the retained ability, with the aid of the bevelled end (4) of the nozzle body, to easily guide the wand (6) into connection with the inner tube (5). The bristles of the brush may be of differing lengths about the periphery in order to further modify the contact angle. The bristles may moreover point somewhat outwards  
15 from the centreline of the nozzle body in order to increase the suction surface and facilitate the insertion of the wand (6).

Figures 5 and 6, finally, show in perspective and in section respectively a combination nozzle wherein the brush head (1) of Figures 3 and 4 is replaced  
20 with a brush head (8) fixed to a tube (7) which can be slid lengthways along the nozzle body (3). The tube (7) has two end positions in which it is retained with snap fastenings. The snap fastenings are not shown in the figures. The end positions are chosen so that in one position, Figures 5a and 6a, the brush head is active when the wand is removed and in the other position the brush head is  
25 retracted far enough so that the bevelled mouth opening (4) of the nozzle body (3) is exposed for use as a flat nozzle, Figures 5b and 6b. The wand (6) can be easily attached to the inner tube (5) with the brush head (8) in either of its end positions. The two snap-lock positions can be achieved in a number of ways such that the snap-locking force is sufficient to retain the tube (7), with the brush head  
30 (8) in place, during vacuuming with the brush head (8) in active position, or in retracted position during vacuuming with the flat nozzle (4), but is still easily overcome in order to slide the tube (7) and brush head (8) between its two end positions. In the end positions, one end of the tube (7) coincides approximately

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with the corresponding end of the nozzle body (3). The tube (7) is so constrained in its motion along the nozzle body that it is prevented from rotating about the latter. This constraint is not shown in Figures 5 and 6 but may be achieved in a known manner e.g. by means of splines or by endowing the outside of the  
5 nozzle body (3) and the inside of the tube (7) with an oval cross-section.

Obviously, specially designed nozzles for additional functions may be attached to the inner tube (5) in place of the wand (6), with all the above-mentioned nozzles in place.

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